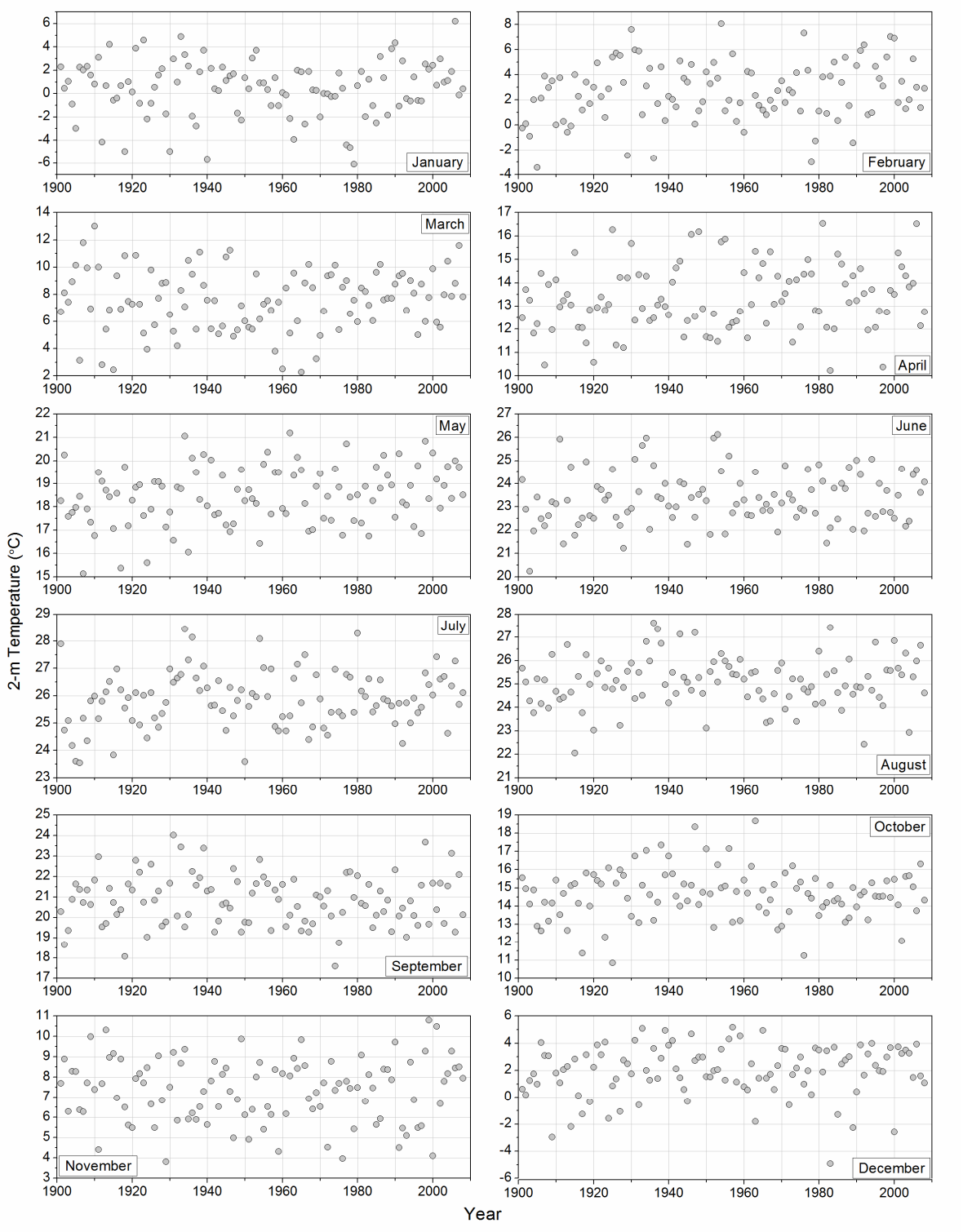

Figure S1. Monthly time series of 2 m temperature based on the CRU data.

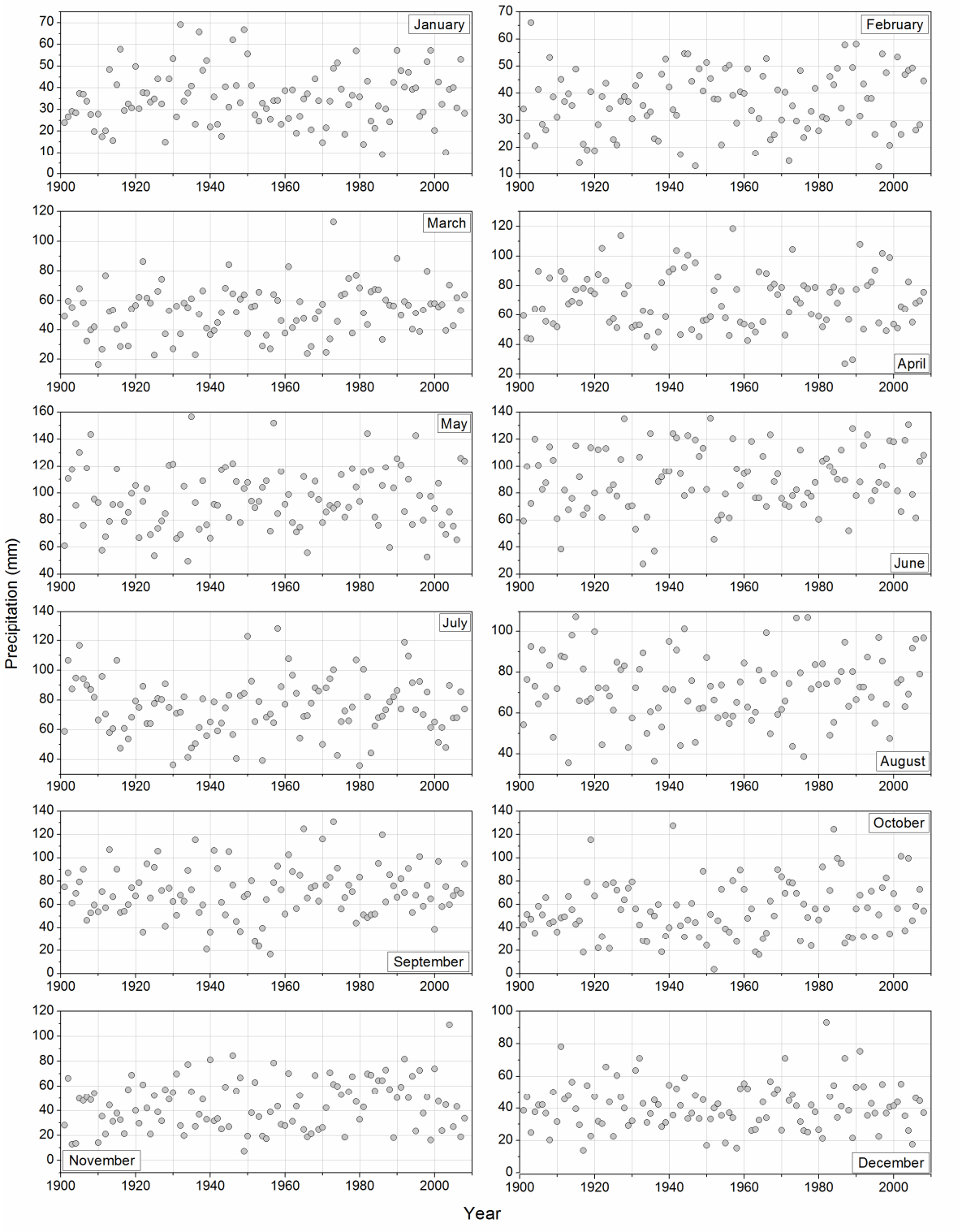

Figure S2. Monthly time series of precipitation based on the CRU data.

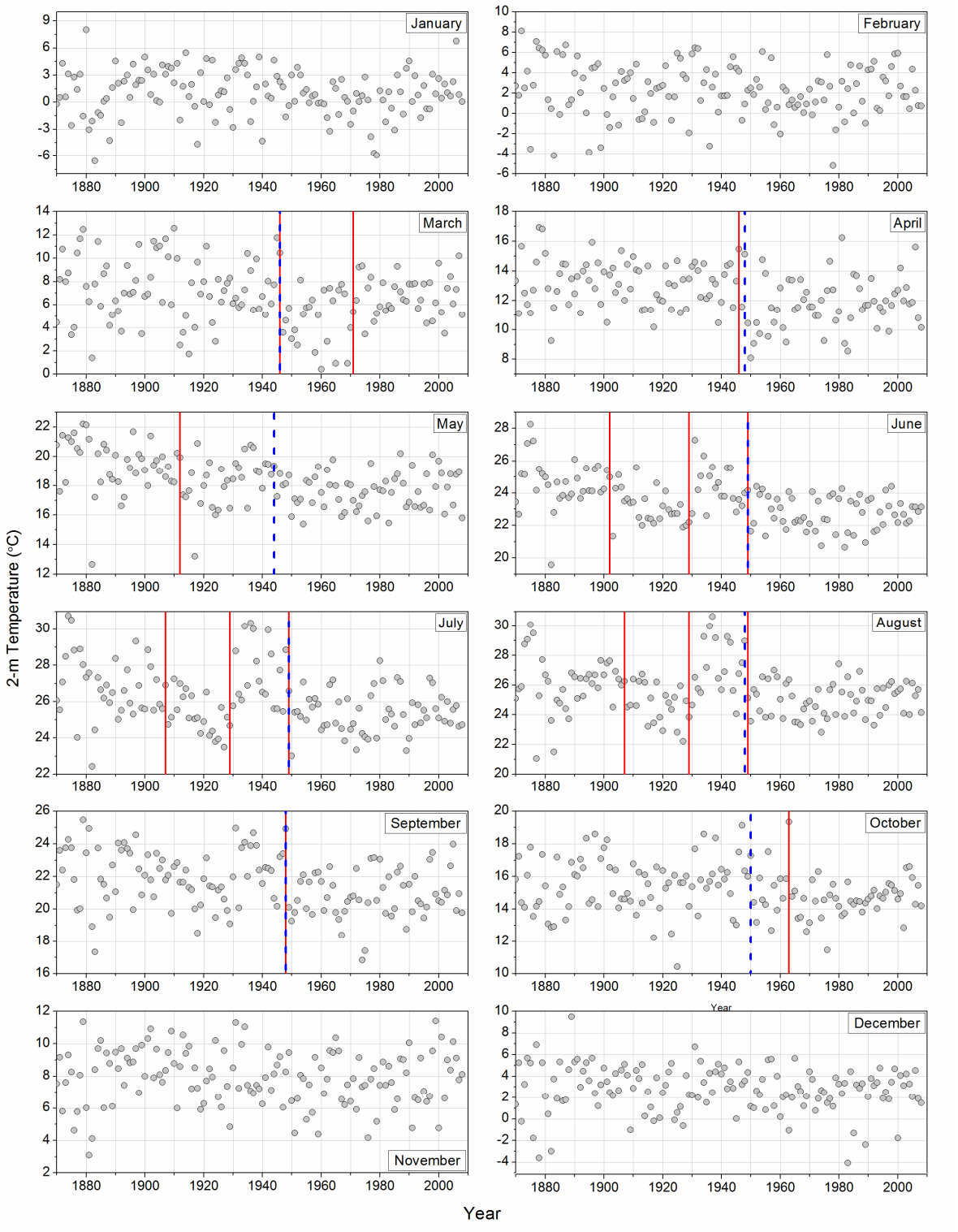

Figure S3. Monthly time series of 2 m temperature based on the 20CR data. The red lines indicate the presence of a change-point based on the Bai-Perron test, while the blue dashed lines indicate the presence of an abrupt change in the mean based on the Pettitt test.

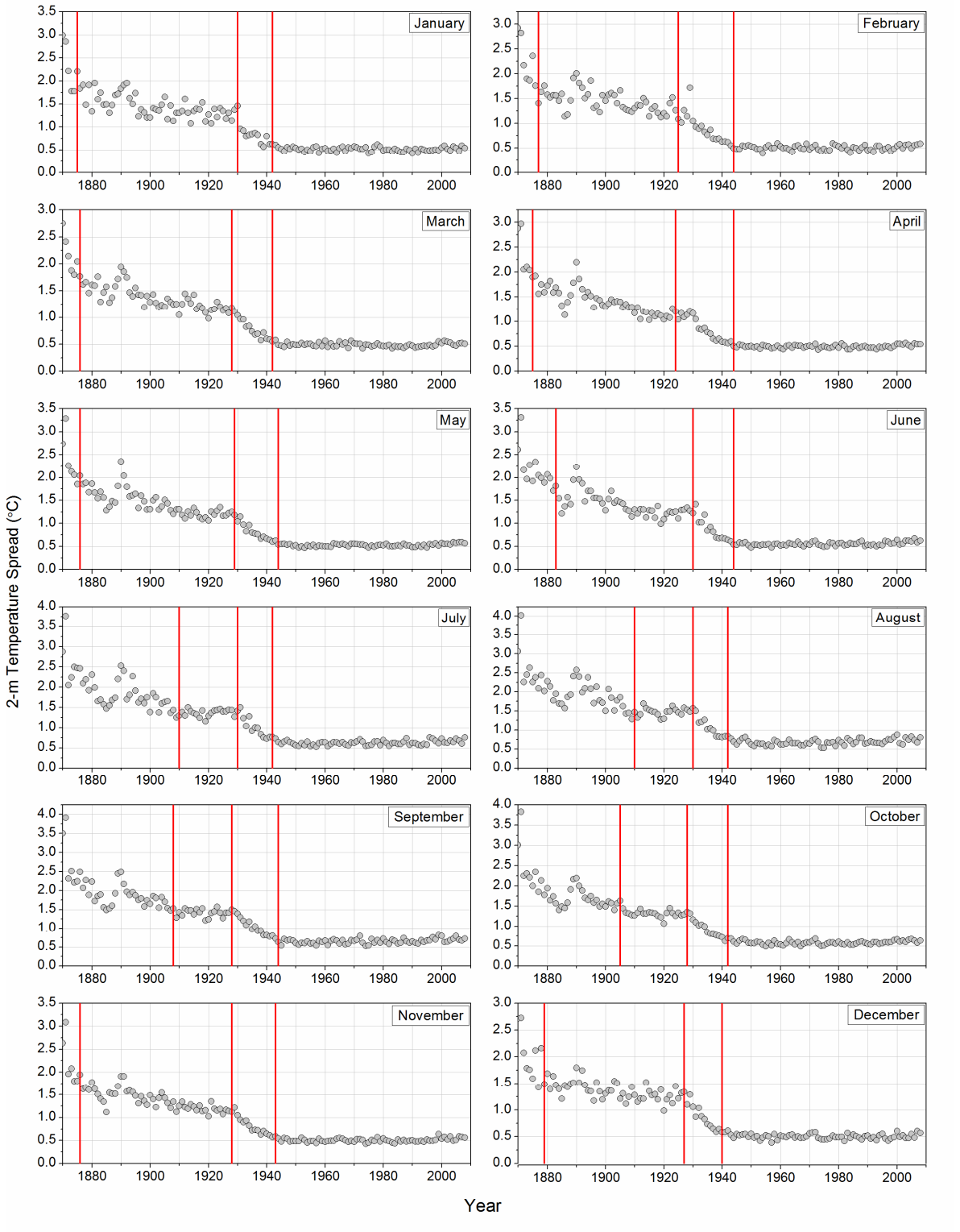

Figure S4. Monthly time-average of the 3-hourly 2 m temperature spread from the 20CR data. The red lines indicate the presence of a change-point based on segmented regression.

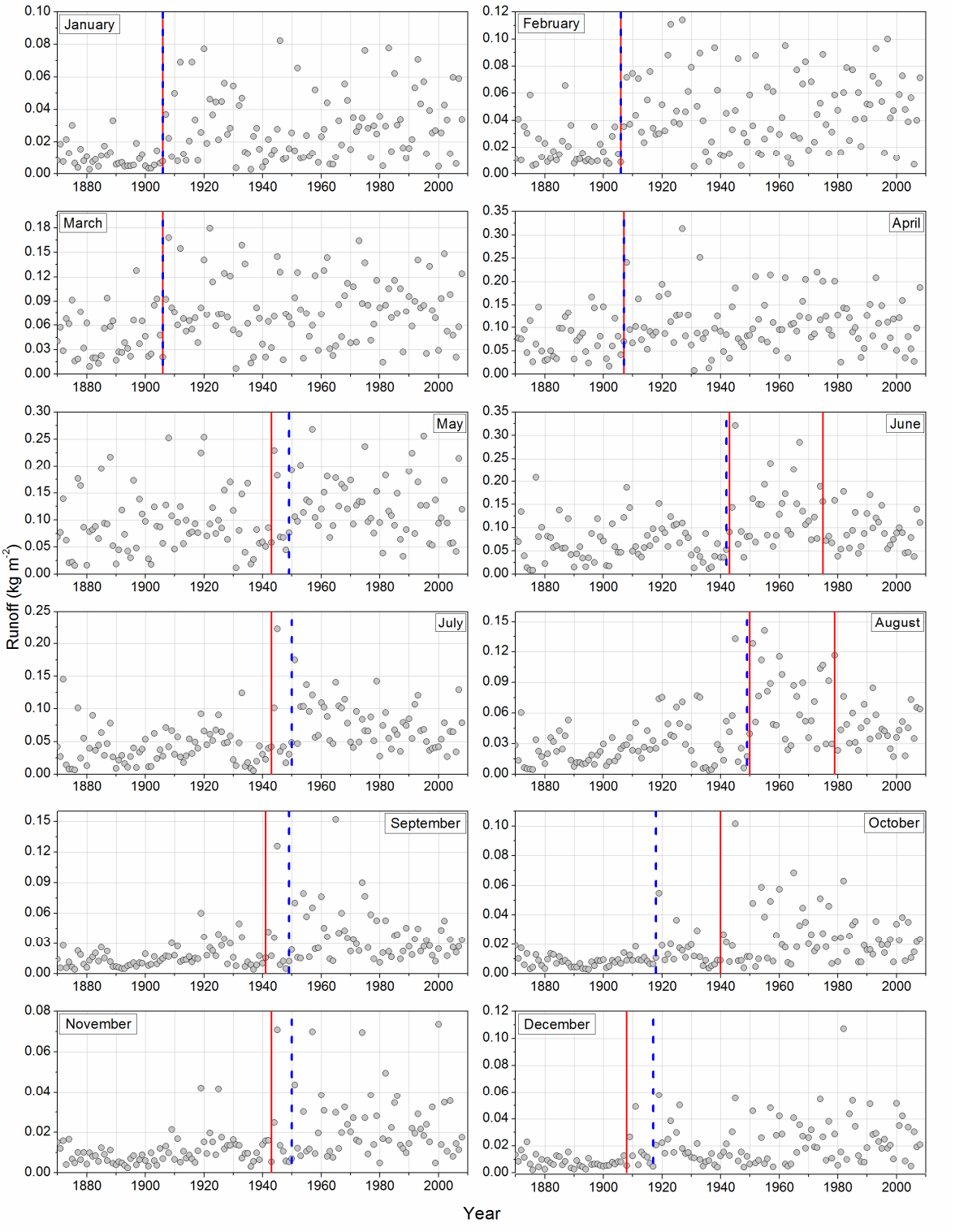

Figure S5. Monthly time series of runoff based on the 20CR data. The red lines indicate the presence of a change-point based on the Bai-Perron test, while the blue dashed lines indicate the presence of an abrupt change in the mean based on the Pettitt test.

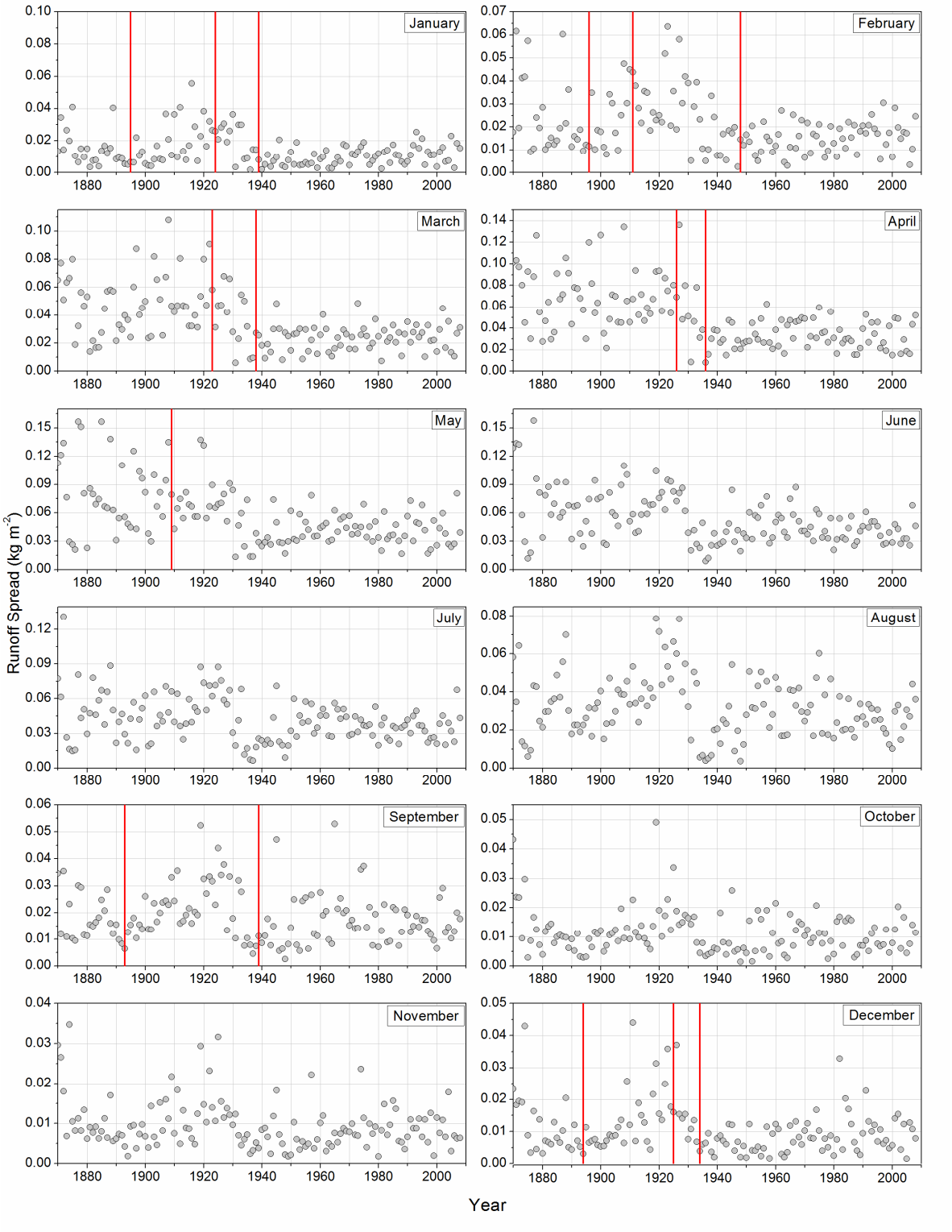

Figure S6. Monthly time-average of the 3-hourly runoff spread from the 20CR data. The red lines indicate the presence of a change-point based on segmented regression.

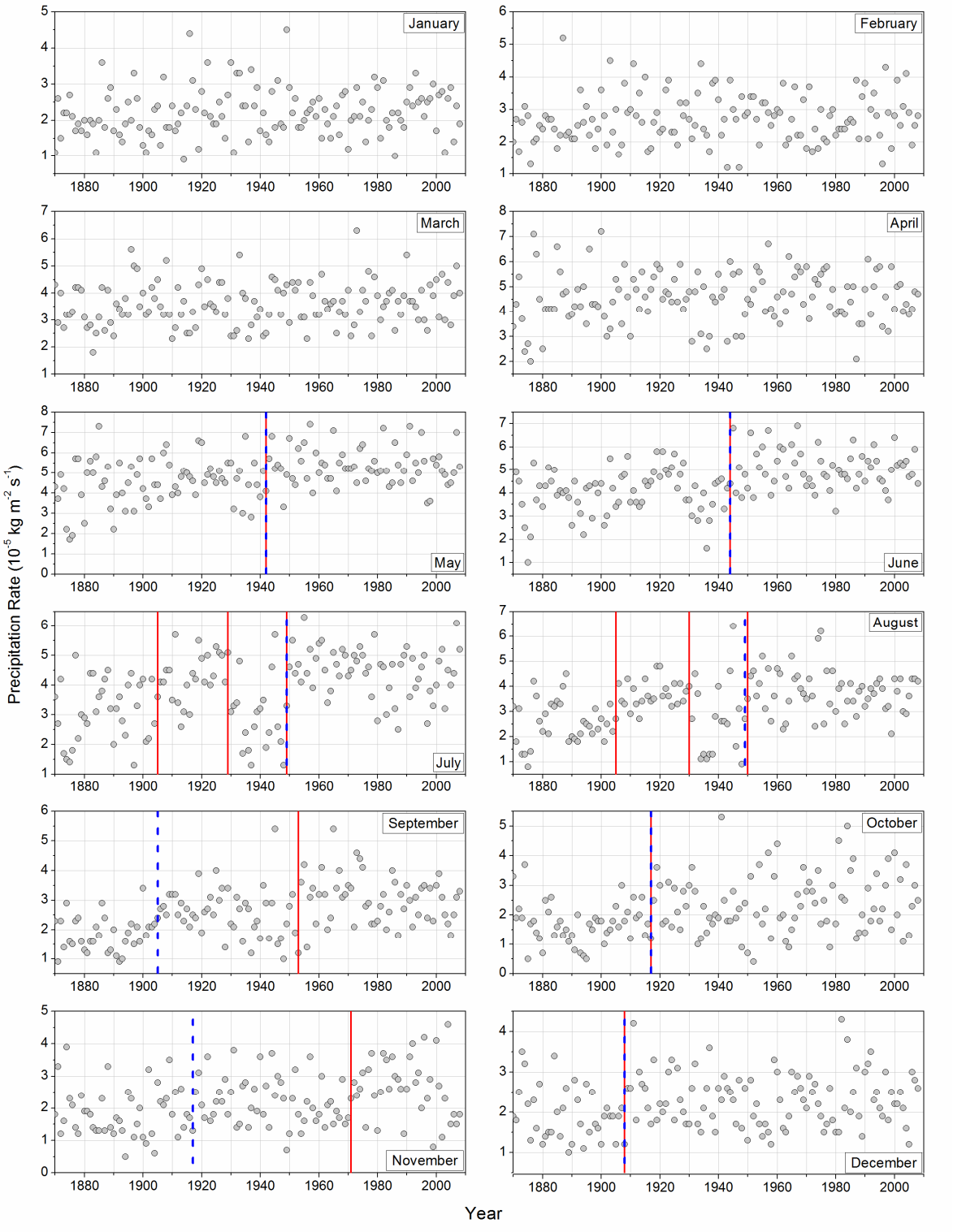

Figure S7. Monthly time series of precipitation rate based on the 20CR data. The red lines indicate the presence of a change-point based on the Bai-Perron test, while the blue dashed lines indicate the presence of an abrupt change in the mean based on the Pettitt test.

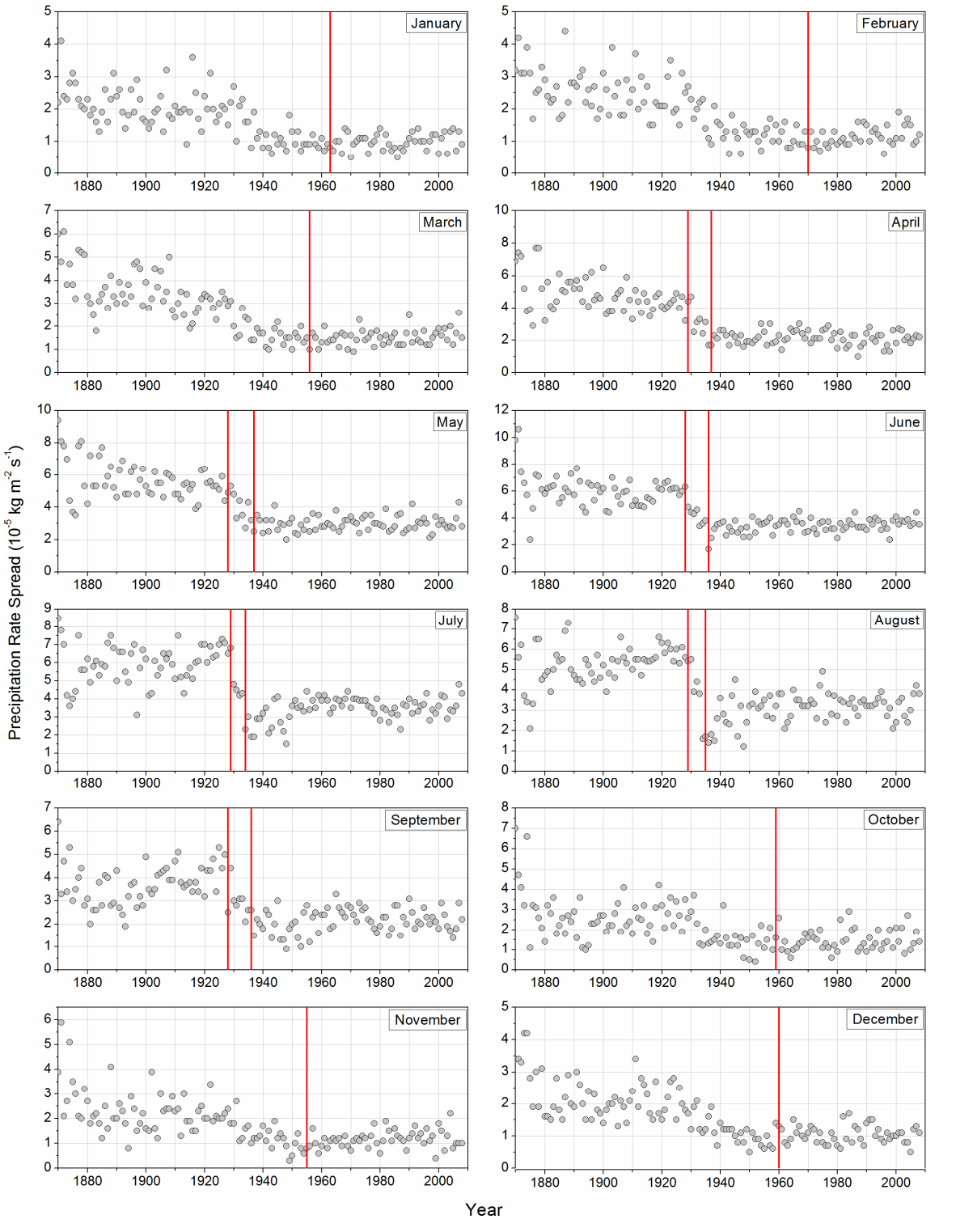

Figure S8. Monthly time-average of the 3-hourly precipitation rate spread from the 20CR data. The red lines indicate the presence of a change-point based on segmented regression.

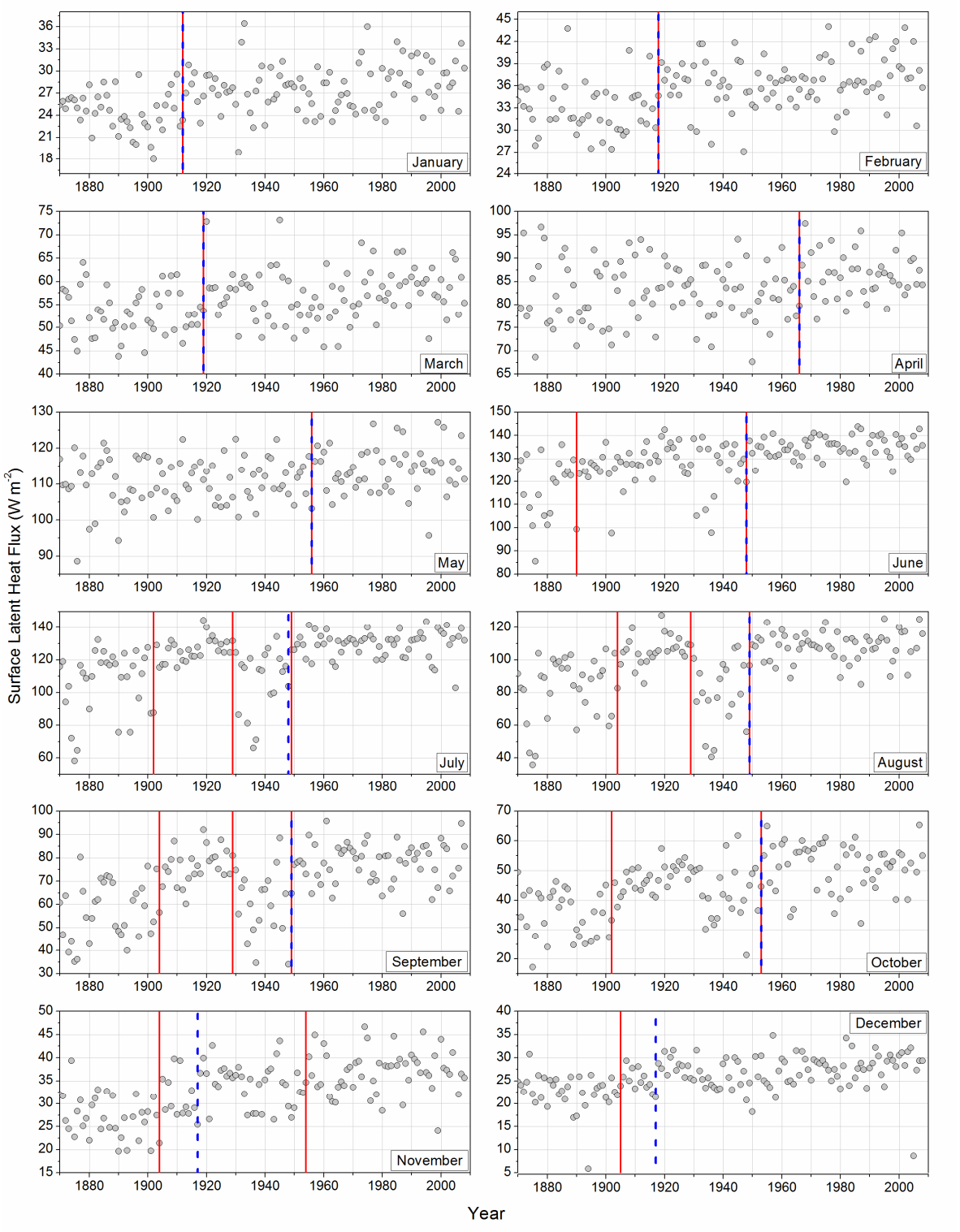

Figure S9. Monthly time series of surface latent heat fluxes based on the 20CR data. The red lines indicate the presence of a change-point based on the Bai-Perron test, while the blue dashed lines indicate the presence of an abrupt change in the mean based on the Pettitt test.

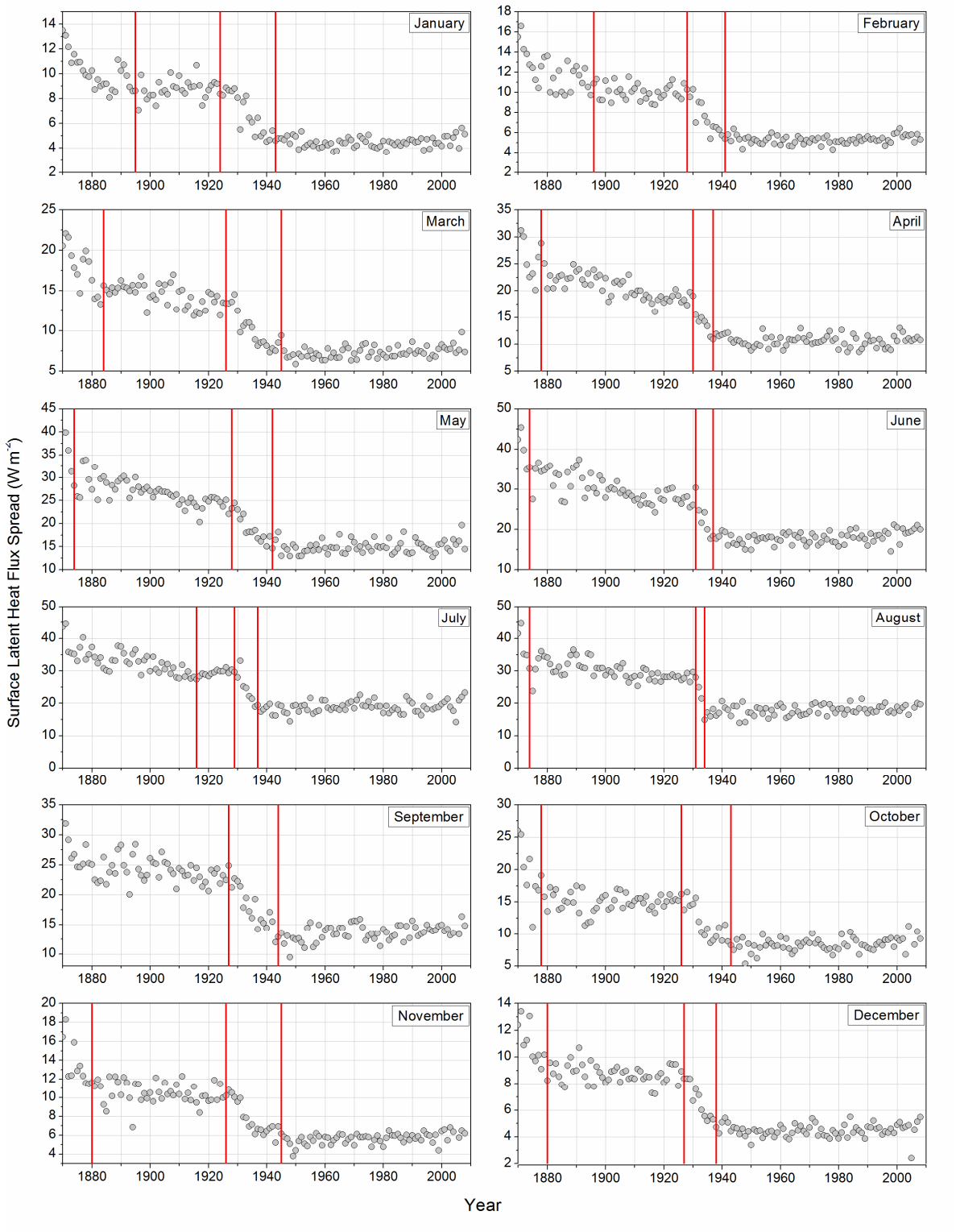

Figure S10. Monthly time-average of the 3-hourly surface latent heat flux spread from the 20CR data. The red lines indicate the presence of a change-point based on segmented regression.

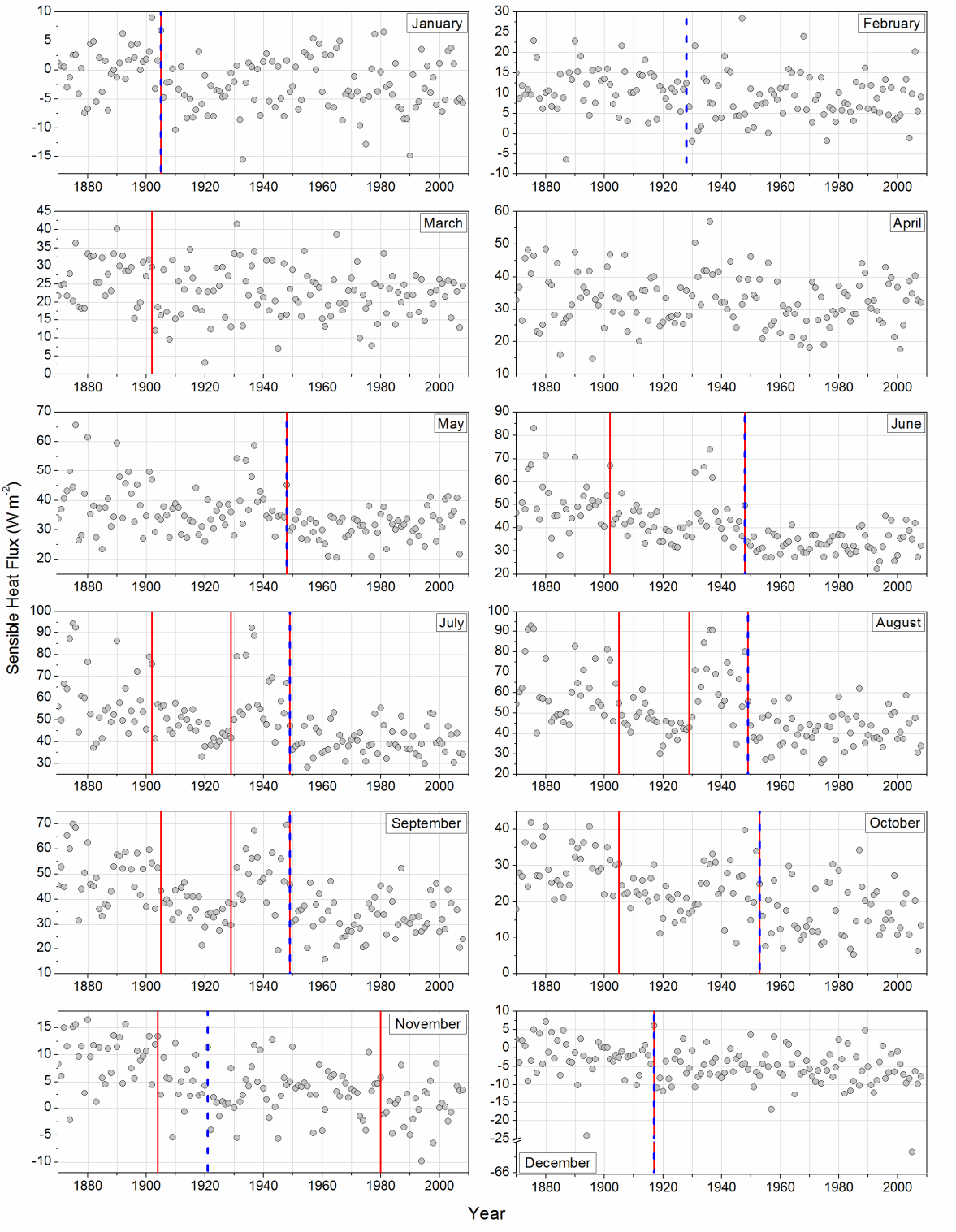

Figure S11. Monthly time series of sensible heat fluxes based on the 20CR data. The red lines indicate the presence of a change-point based on the Bai-Perron test, while the blue dashed lines indicate the presence of an abrupt change in the mean based on the Pettitt test.

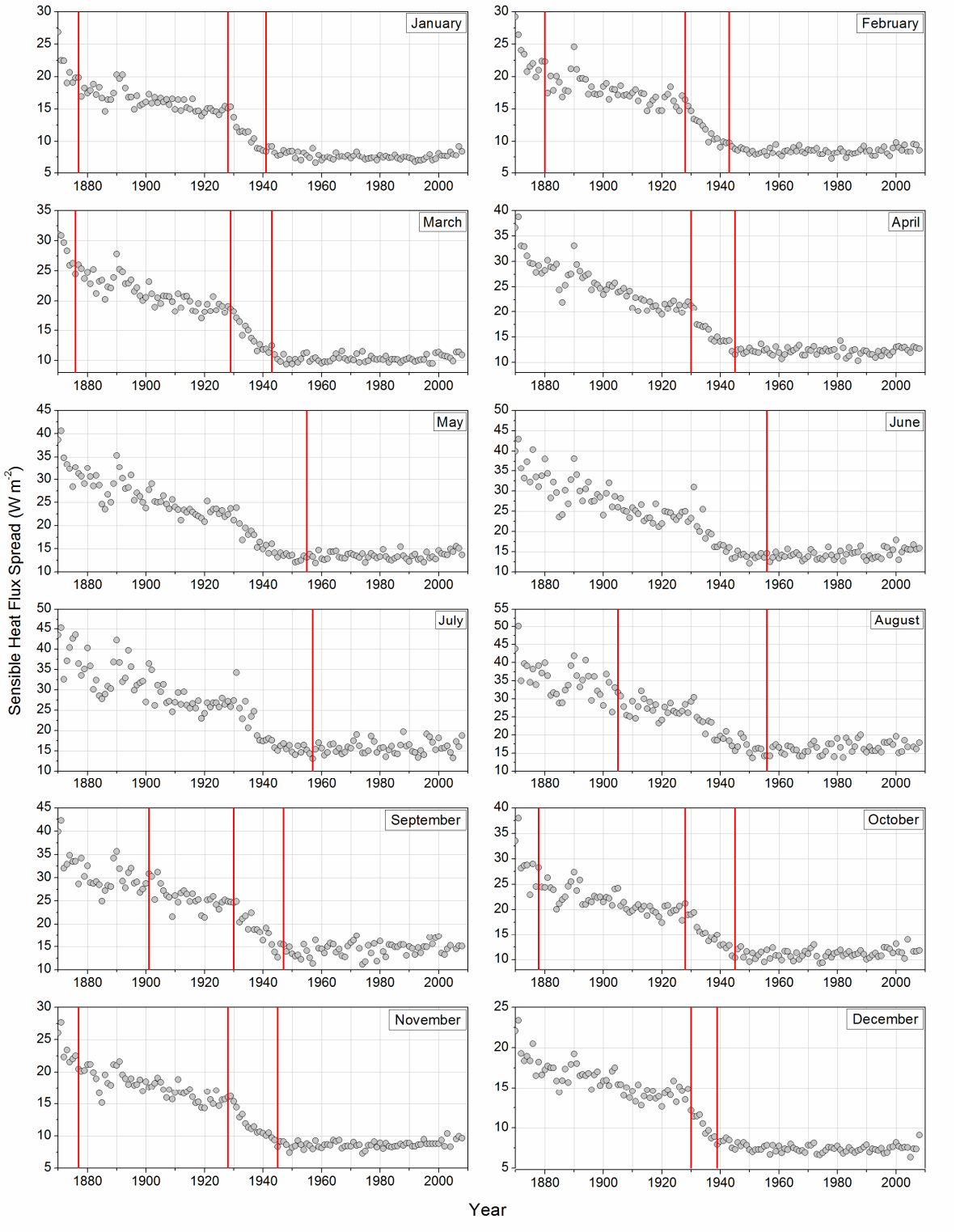

Figure S12. Monthly time-average of the 3-hourly sensible heat flux spread from the 20CR data. The red lines indicate the presence of a change-point based on segmented regression.

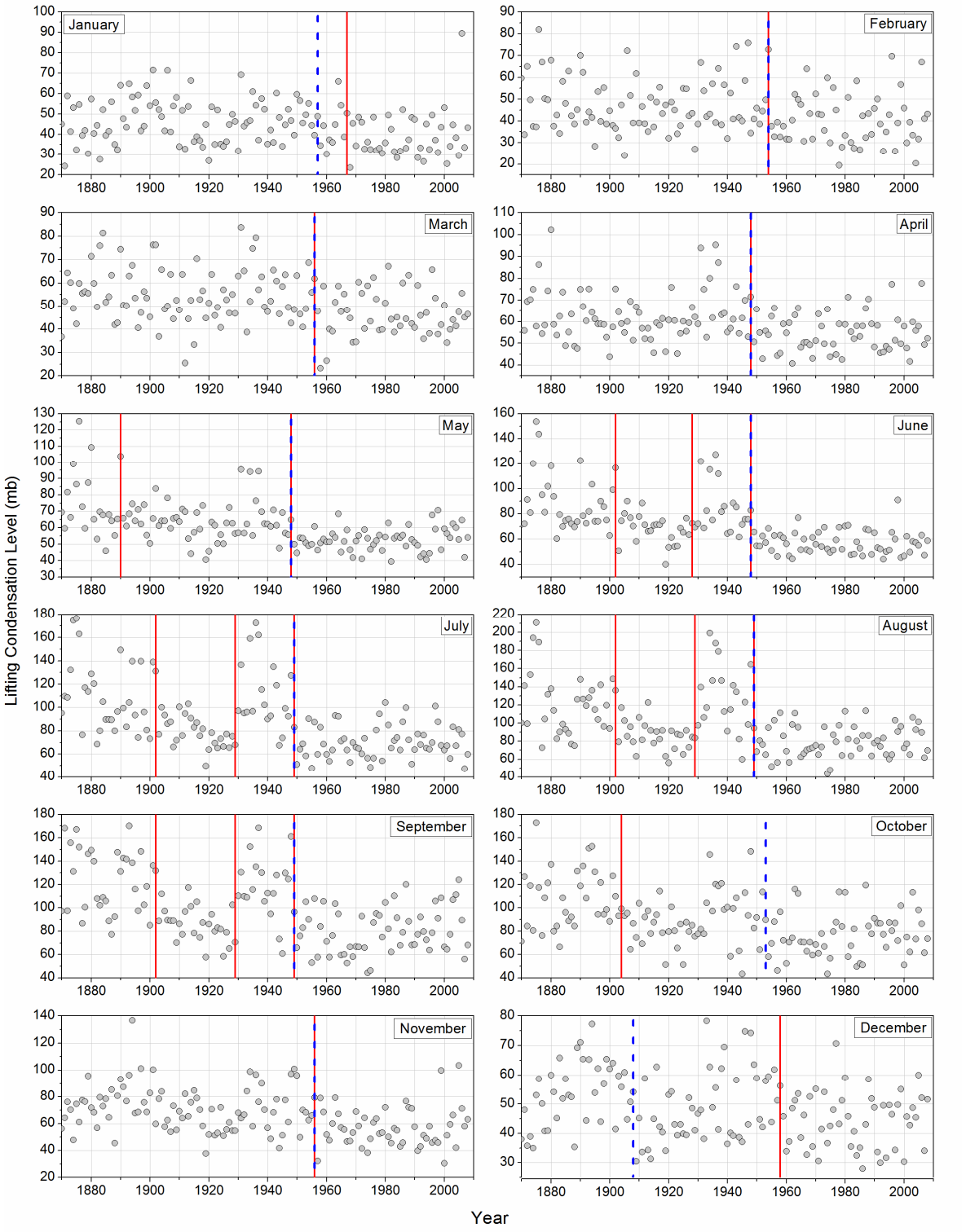

Figure S13. Monthly time series of surface-based lifting condensation level based on the 20CR data. The red lines indicate the presence of a change-point based on the Bai-Perron test, while the blue dashed lines indicate the presence of an abrupt change in the mean based on the Pettitt test.

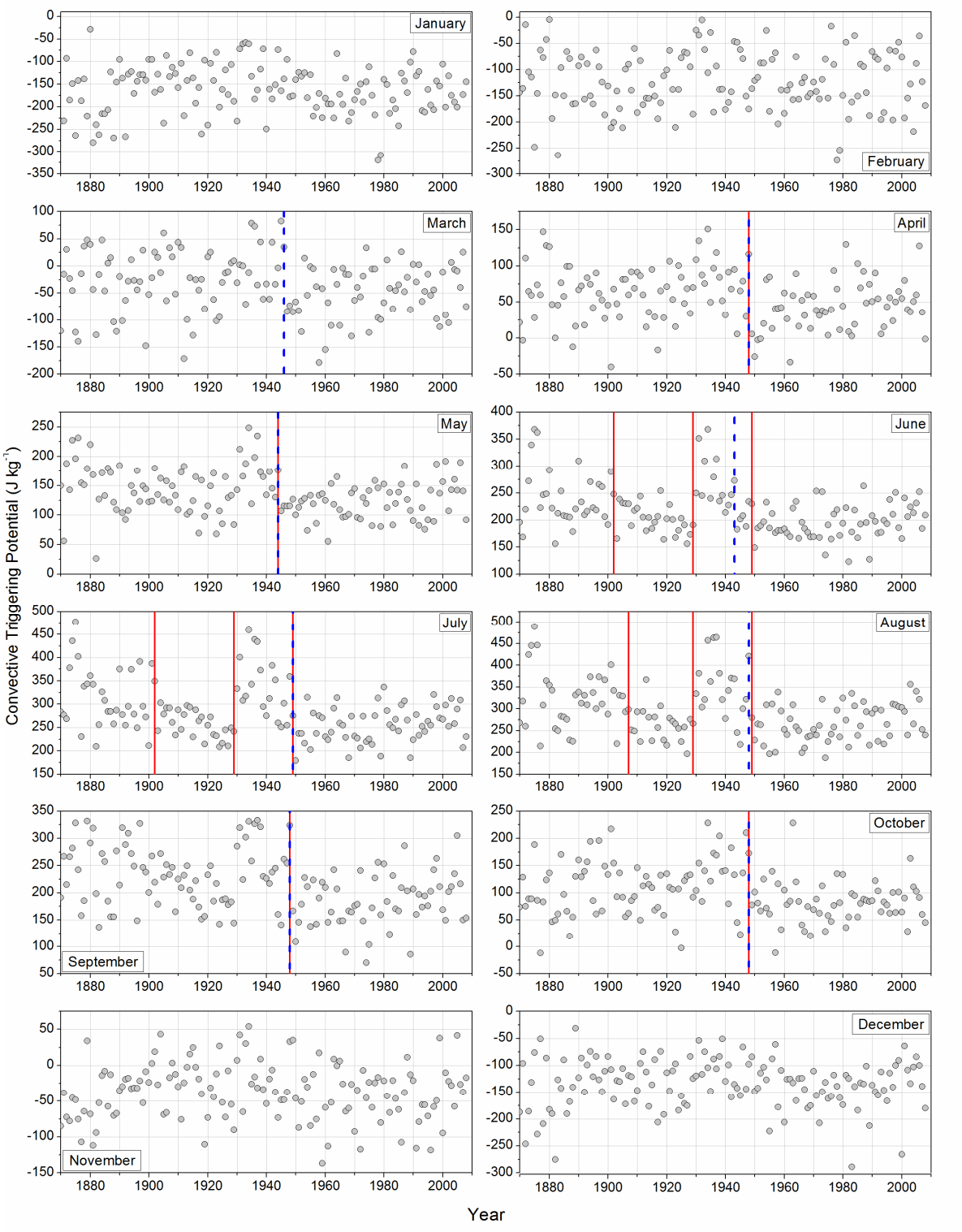

Figure S14. Monthly time series of convective triggering potential based on the 20CR data. The red lines indicate the presence of a change-point based on the Bai-Perron test, while the blue dashed lines indicate the presence of an abrupt change in the mean based on the Pettitt test.

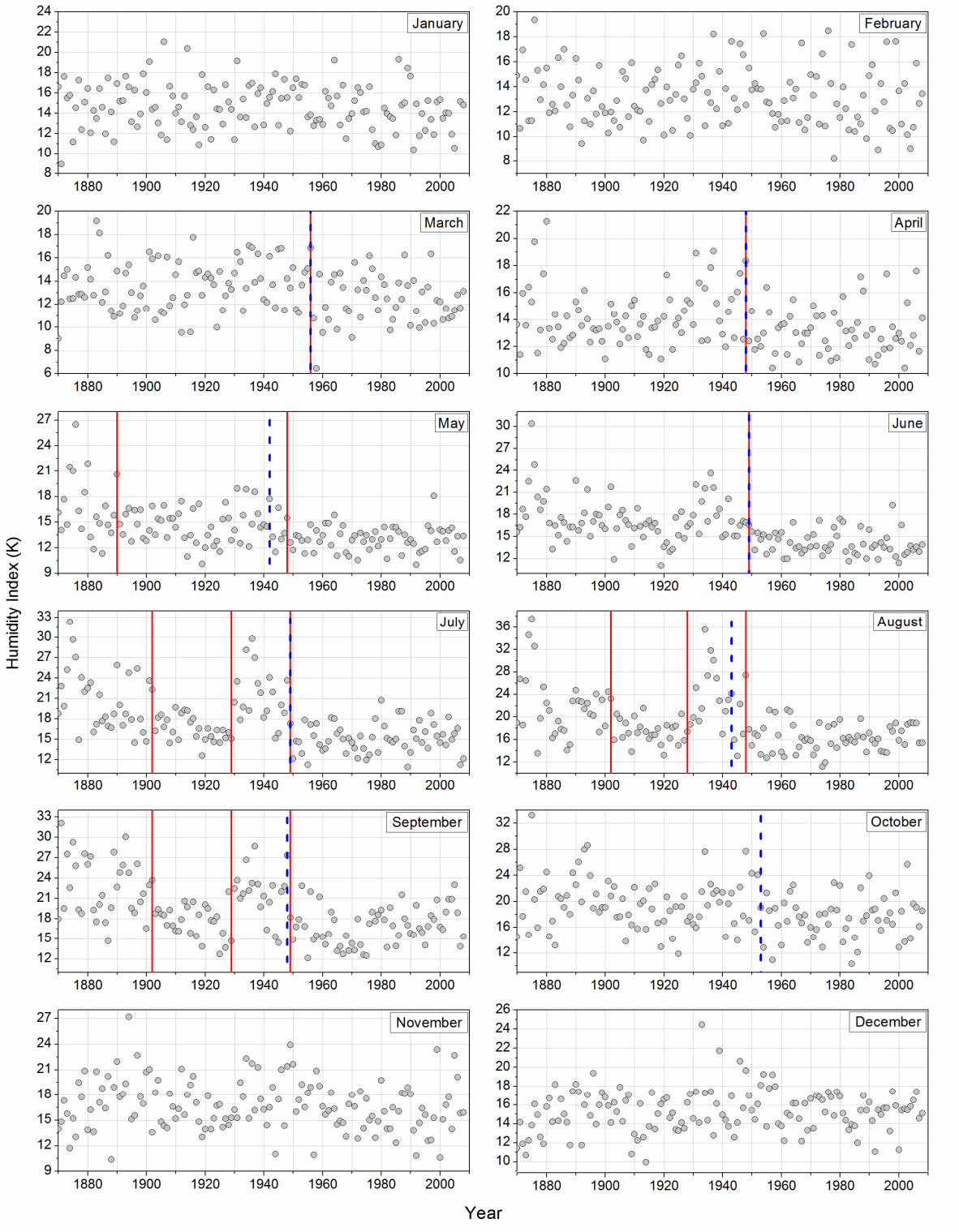

Figure S15. Monthly time series of humidity index based on the 20CR data. The red lines indicate the presence of a change-point based on the Bai-Perron test, while the blue dashed lines indicate the presence of an abrupt change in the mean based on the Pettitt test.

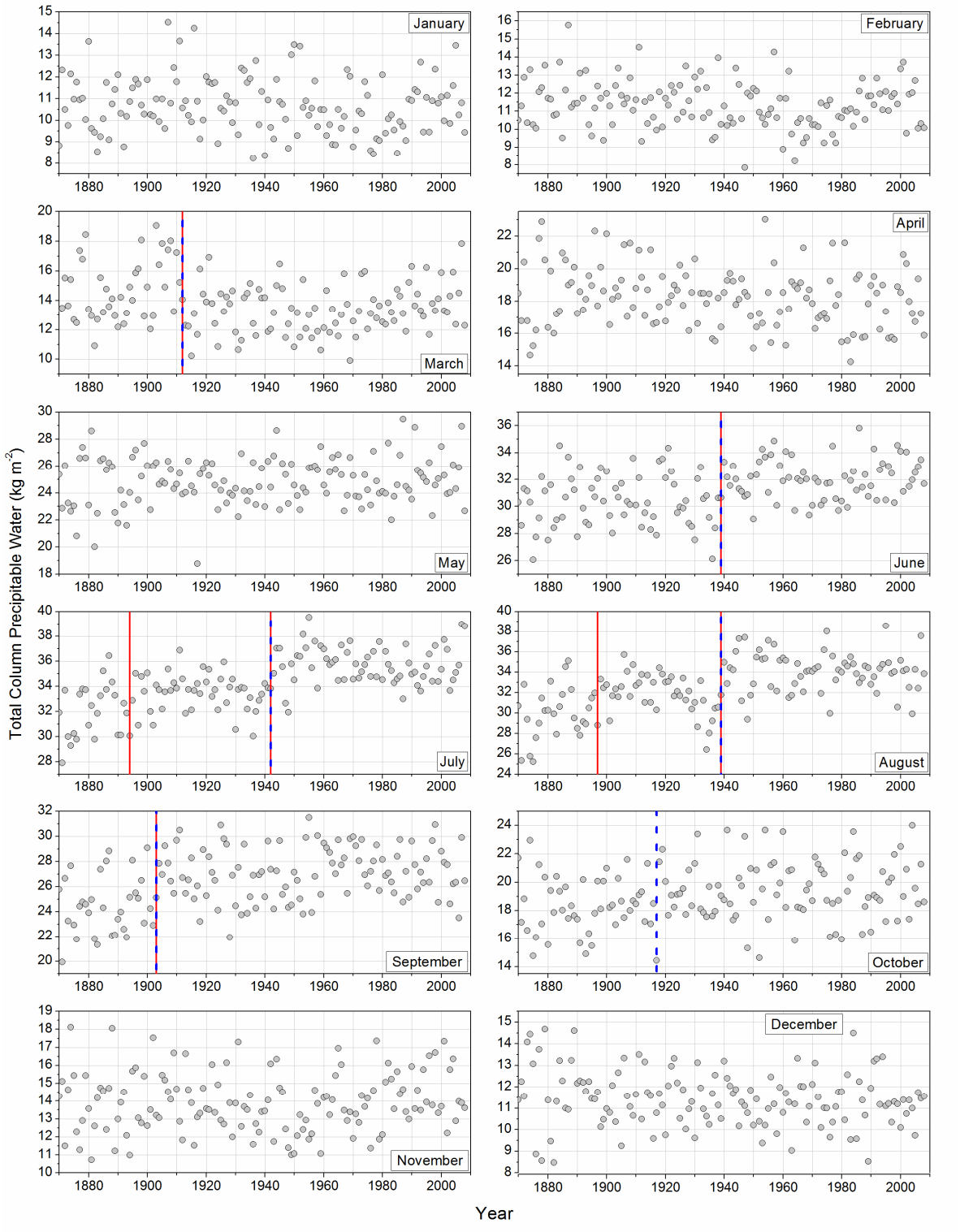

Figure S16. Monthly time series of total column precipitable water based on the 20CR data. The red lines indicate the presence of a change-point based on the Bai-Perron test, while the blue dashed lines indicate the presence of an abrupt change in the mean based on the Pettitt test.

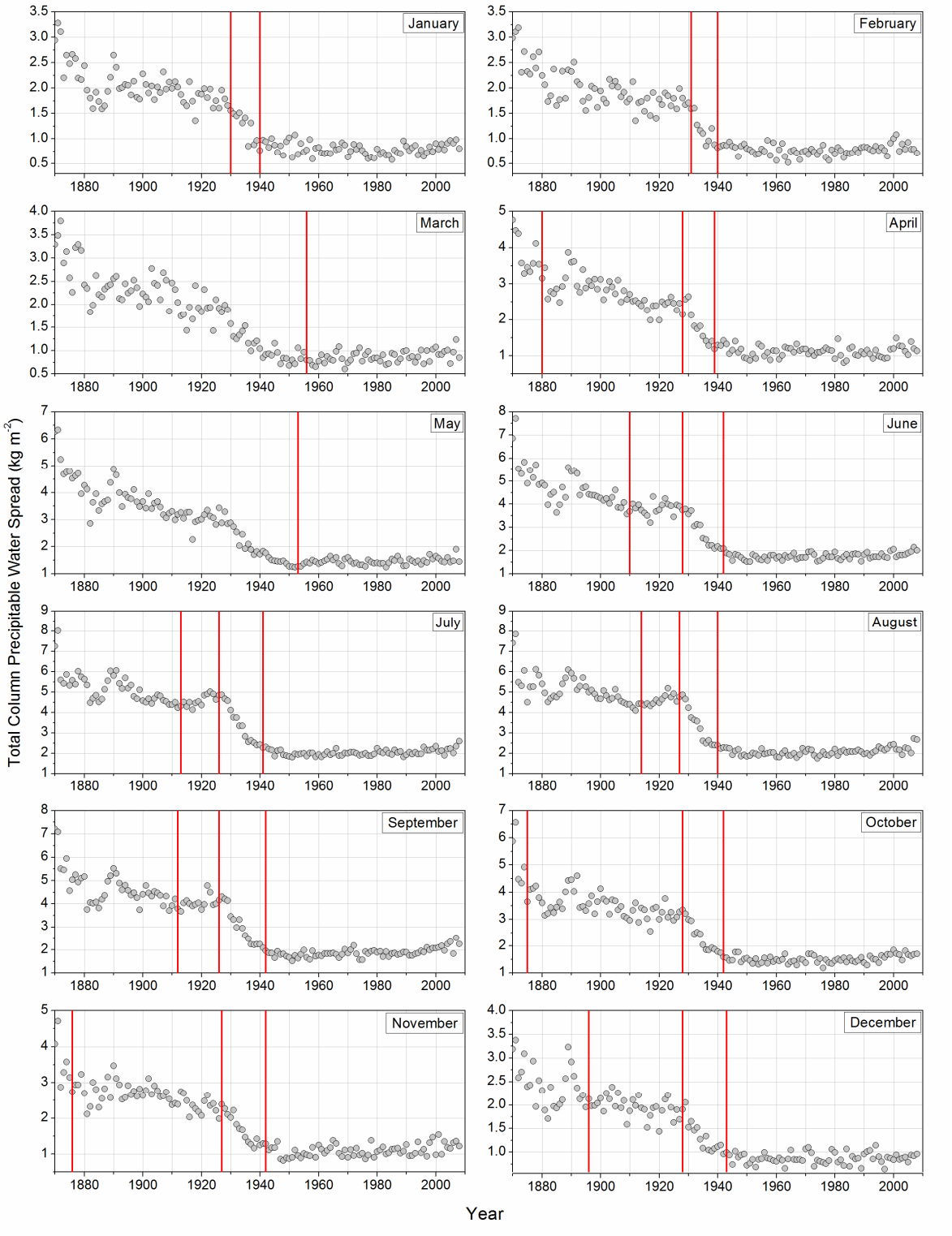

Figure S17. Monthly time-average of the 3-hourly total column precipitable water spread based on the 20CR data. The red lines indicate the presence of a change-point based on segmented regression.

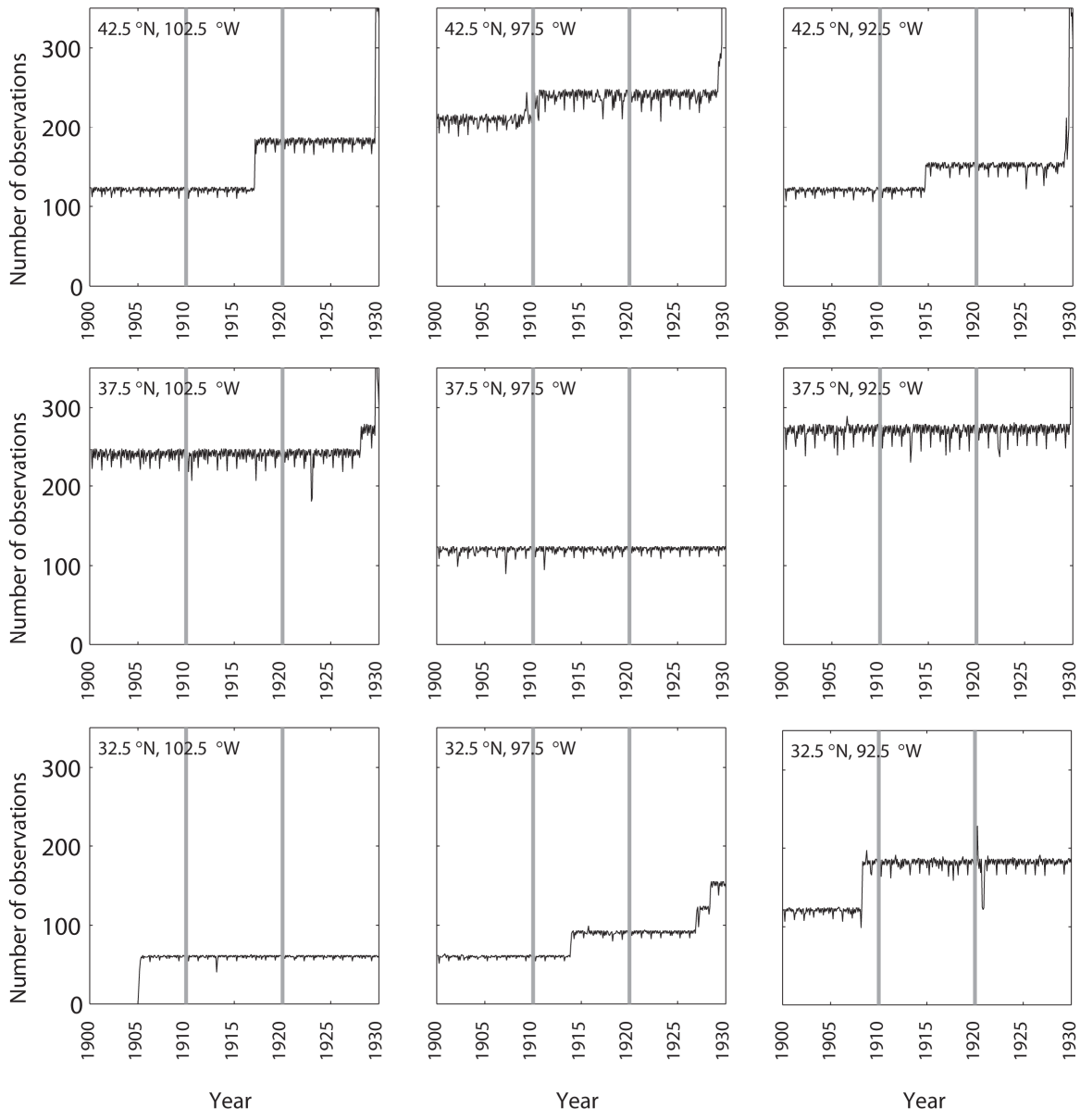

Figure S18. For the period of 1900-1930, the monthly total number of observations assimilated by 20CR from each of the nine 5° x 5° grid boxes that comprise the study region.

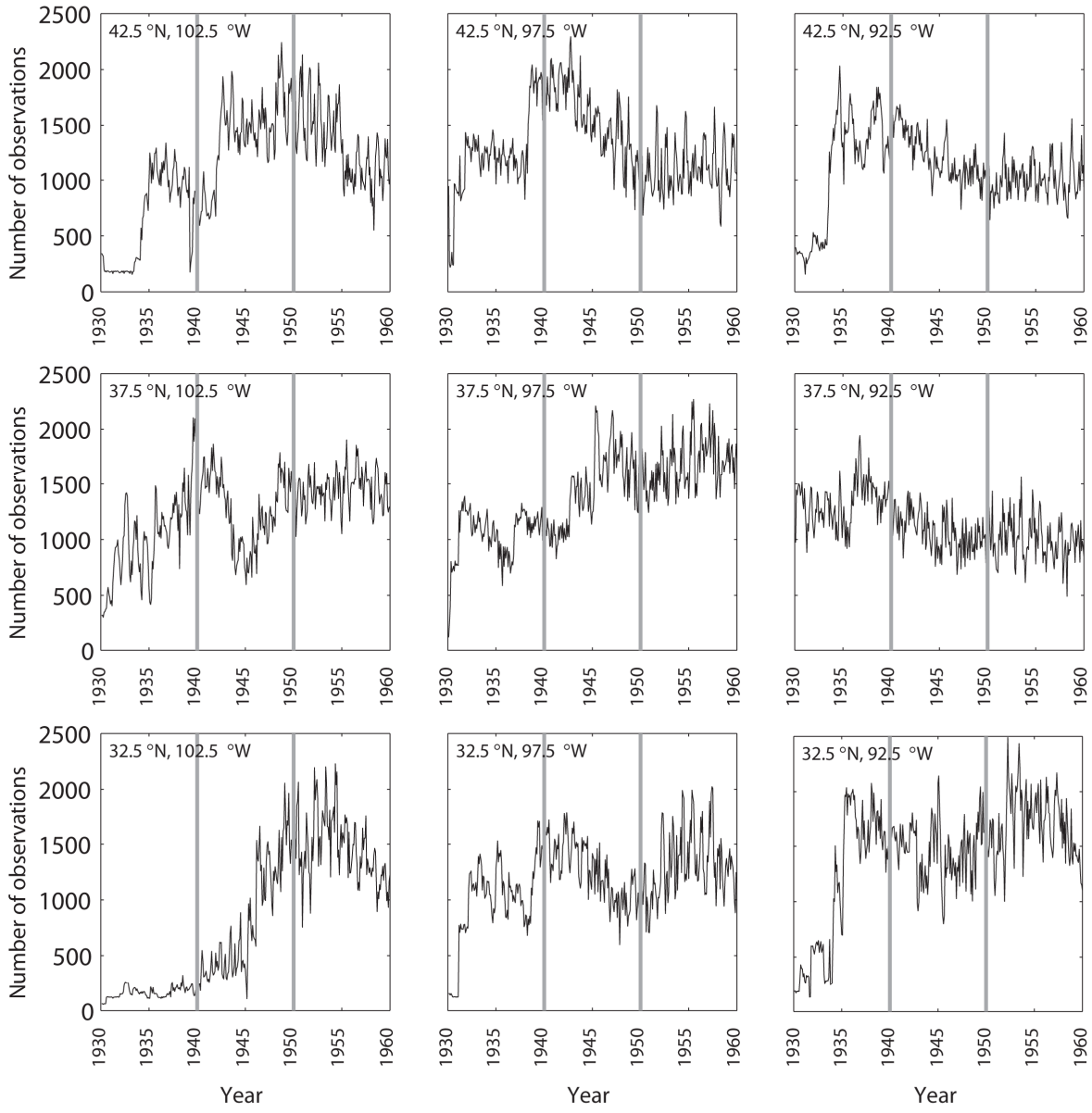

Figure S19. For the period of 1930-1960, the monthly total number of observations assimilated by 20CR from each of the nine 5° x 5° grid boxes that comprise the study region.